



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/523,371

06/21/2005

Jeffrey J. Spiegelman

3194.1026-006

3702

21005

7590

12/31/2008

HAMILTON, BROOK, SMITH & REYNOLDS, P.C.

530 VIRGINIA ROAD

P.O. BOX 9133

CONCORD, MA 01742-9133

EXAMINER

CARRILLO, BIBI SHARIDAN

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

12/31/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/523,371	Applicant(s) SPIEGELMAN ET AL.	
	Examiner Sharidan Carrillo	Art Unit 1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 October 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,8,9,11-15 and 36-49 is/are pending in the application.
- 4a) Of the above claim(s) 12,13,36 and 37 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,8,9,11,14,15 and 38-49 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1,3-5,8,9,11-15 and 36-49 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>2/2/05, 8/4/05, 5/26/06, 1/29/07, 12/03/07, 10/14/08</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 5, 39, 41, and 48-49 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5 is indefinite because it is unclear the concentrations refer to the concentration of the purified purge gas or the concentration of the AMC in the purified purge gas. Claim 39 and 48 are indefinite because it is unclear how the purged gas is inert since oxygen is not considered as an inert gas. Claims 41 and 49 are indefinite because it is unclear how the purge gas comprises extra clean dry air since the independent claims define the purge gas as oxygen.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 1792

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1, 3-5, 8-9, 11, 38-39, 41-43, 46, and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6427703) in view of Alvarez Jr. et al. (6391090).

In reference to claims 1 and 46, Somekh teaches purging a lithography chamber with water vapor/oxygen containing compound to remove carbon contamination (Figs. 2a, 4) and removing the contamination with a vacuum pump (col. 5, lines 35-40, col. 6, lines 20-25). In reference to the limitations of a purge gas comprising oxygen and water, the teachings of adding water to the purge gas reads on

Art Unit: 1792

applicant's claimed invention. Additionally, claim 2 of Somekh teaches water vapor doped oxygen compounds. Additionally, it is well known, as evidenced by Kern (Handbook of Semiconductor Wafer Cleaning Technology, 1993, pages 88-89), that oxygen gas contains a small concentration of contaminants such as water. Therefore, one would reasonably expect the oxygen gas of Somekh to include water vapor. Somekh fails to teach purified gases having an AMC concentration level of less than 1ppb.

Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Somekh to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to claims 3-5, it would have been well within the level of the skilled artisan to repeatedly purify the gases until the desired level of contaminants of less than 1ppb or lower is achieved. Arguably, the skilled artisan would have recognized the advantages of reducing the contaminants in the purified lens gases to values in the ppt range and/or close to zero. In reference to claims 8-9, Somekh fails to teach water in the gas of at least about 100 ppm. Alvarez teaches reducing the amount of water to as low as 10-100ppm.

Art Unit: 1792

In reference to claims 11 and 38, refer to col. 6, lines 1-5 of Somekh. Re claims 39 and 48, in view of the indefiniteness, the teachings are met by Somekh. Re claims 41 and 49, in view of the indefiniteness, the teachings are met by Somekh.

In reference to claims 42 and 46, Somekh in view of Alvarez fails to teach the purified gas removing AMC at a faster rate than the same method using nitrogen. However, since Somekh teaches contacting the substrate with water vapor, one would reasonably expect the rate of removal of AMC to be faster than nitrogen having no water present since Somekh is performing the same method steps using the same composition as instantly claimed and recited in the specification. The burden is shifted on applicant to show why the purge gases of Somekh would not produce a faster rate of removal of AMC, especially since the instant specification teaches increasing of the water content increases the removal rate. Re claim 43, refer to col. 6, line 24 of Somekh.

6. Claims 14-15 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Somekh (6427703) in view of Alvarez Jr. et al. (6391090), as applied to claims 1, 3-5, 8-9, 11, 38-39, 41-43, 46, 48-49, as described in paragraph 5 above, and further in view of Van Schaik et al. (6724460).

Somekh in view of Alvarez fail to teach purging with an inert gas. Van Schaik et al. teach in-situ cleaning of optical components for use in a lithographic apparatus. In col. 4, lines 1-22, Van Schaik teach purging with nitrogen. It would have been obvious to a person of ordinary skill in the art to have modified the method of Somekh to include purging with an inert gas, since Van Schaik et al. teach it is conventional to purge with

Art Unit: 1792

an inert gas in order to remove contaminants from the lithographic apparatus. Re claim 40, Van Schaik teaches 20% of oxygen (col. 9, lines 40-45).

7. Claims 1, 3-5, 8-9, 11, 14-15, 38-43, 46, and 48-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Schaik et al. (6724460) in view of Alvarez Jr. et al. (6391090).

Van Schaik et al. teach in-situ cleaning by purging a lithographic apparatus with a purge gas composition. In col. 7, lines 23-25, Van Schaik teaches the purge gas may contain one or a mixture of oxygen containing species selected from water, nitrogen oxides and oxygen containing hydrocarbons. Therefore, Van Schaik teaches a mixture of water and nitrogen oxides, which reads on applicant's claim language of water in combination with oxygen.

Van Schaik fails to teach purification of the purge gas to less than 1 ppm. Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Van Schaik to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to claims 3-5, it would have been well within the level of the skilled artisan to repeatedly purify the gases until the desired level of contaminants of less than 1ppb or lower is achieved. Arguably, the skilled artisan would have recognized the advantages

Art Unit: 1792

of reducing the contaminants in the purified lens gases to values in the ppt range and/or close to zero. Re claims 8-9, refer to claim 13 of Van Schaik. Re claims 11 and 38, refer to col. 10, lines 5-7 of Van Schaik. Re claims 14-15, refer to col. 7, lines 57-68. Re claims 39, 41, 48 and 49, and in view of the indefiniteness, the limitations are met by the teachings of Van Schaik. Re claim 40, refer to col. 9, lines 40-45 of Van Schaik. Re claims 42 and 46, Van Schaik in view of Alvarez fails to teach the purified gas removing AMC at a faster rate than the same method using ultra high purity nitrogen without water added thereto. However, since Van Schaik in combination with Alvarez teach contacting the substrate with oxygen, wherein the oxygen has a certain concentration of water present, one would reasonably expect the rate of removal of AMC to be faster than nitrogen having no water present since Van Schaik is performing the same method steps using the same composition as instantly claimed and recited in the specification. The burden is shifted on applicant to show why the purge gases of Van Schaik, such oxygen, having a concentration of water present therein, would not produce a faster rate of removal of AMC. Re claim 43, refer to col.8, lines 2-10.

8. Claims 1, 3-5, 8-9, 11, and 38-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Net et al. (US2005/0017198) in view of Alvarez Jr. et al. (6391090).

Van Der Net teaches purging an optical component of a lithographic apparatus to remove contaminants with an ultra high purity gas comprising dry air in combination with moisture (paragraphs 43, 53). The limitations of oxygen are met since it is well known that a major component of air includes oxygen.

Van Der Net et al. fail to teach purification of the purge gas to less than 1 ppm. Alvarez Jr. et al. teach purification of gases used in photolithography in order to reduce the contamination level to 1ppb or lower (col. 7, lines 7-10, col. 8, lines 15-17) such that molecular contaminants on the optical components of the lithography tool is reduced. In col. 8, line 17, Alvarez teaches 100ppt.

It would have been obvious to a person of ordinary skill in the art to have modified the method of Van Der Net to include purification of the lens gases, as taught by Alvarez such that contaminants in the optical components can be avoided. In reference to claims 3-5, it would have been well within the level of the skilled artisan to repeatedly purify the gases until the desired level of contaminants of less than 1ppb or lower is achieved. Arguably, the skilled artisan would have recognized the advantages of reducing the contaminants in the purified lens gases to values in the ppt range and/or close to zero. Re claims 8-9, Van Der Net teaches adjusting the moisture between about 0-100% (paragraph 55). Re claims 11 and 38, refer to paragraph 28, which teaches a wafer. Re claims 39 and 48, in view of the indefiniteness, the limitations are met by the prior art. Re claim 40, it is well known and conventional in the art that dry air comprises 20% by volume of oxygen, as further evidenced by Engineering Tool Box. Re claims 41 and 49, Van Der Net teaches purified CDA which reads on extra clean dry air. Re claims 42 and 46, Van Der Net in view of Alvarez fails to teach the purified gas removing AMC at a faster rate than the same method using ultra high purity nitrogen without water added thereto. However, since Van Der Net in combination with Alvarez teach contacting the substrate with purge gas comprising oxygen, wherein the purge

Art Unit: 1792

gas has a certain concentration of water present, one would reasonably expect the rate of removal of AMC to be faster than nitrogen having no water present since Van Der Net is performing the same method steps using the same composition as instantly claimed and recited in the specification. The burden is shifted on applicant to show why the purge gases of Van Der Net, having a concentration of water present therein, would not produce a faster rate of removal of AMC. Re claim 43, refer to paragraph 43 of Van Der Net. Re claims 44-45, and 47, paragraph 49 teaches ambient conditions, which are no higher than 80C or no higher than 50C.

9. Claims 14-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van Der Net et al. (US2005/0017198) in view of Alvarez Jr. et al. (6391090), as applied to claims 1, 3-5, 8-9, 11, and 38-49, as described in paragraph 8 above, and further in view of Van Schaik et al. (6724460).

Van Der Net in view of Alvarez fail to teach purging with an inert gas. Van Schaik et al. teach in-situ cleaning of optical components for use in a lithographic apparatus. In col. 4, lines 1-22, Van Schaik teach purging with nitrogen. It would have been obvious to a person of ordinary skill in the art to have modified the modified method of Van Der Net et al. to include purging with an inert gas, since Van Schaik et al. teach it is conventional to purge with an inert gas in order to remove contaminants from the lithographic apparatus.

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory

Art Unit: 1792

obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

11. Claims 1, 38, 41, 46, and 49 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 19-21 of U.S. Patent No. 7377982. Although the conflicting claims are not identical, they are not patentably distinct from each other because the claims are directed to removing contaminants from a substrate using a purified purge gas comprising water.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sharidan Carrillo whose telephone number is 571-272-1297. The examiner can normally be reached on M-W, F 6:30-5:00pm, alternating Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on 571-272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1792

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Sharidan Carrillo/
Primary Examiner, Art Unit 1792

bsc